

ORIGINAL ARTICLE

Efficacy of Dexpanthenol, Olive Oil and Breast Milk for the Nipple Crack Treatment in Lactating Mothers

NOREEN KOUSAR¹, MUHAMMAD TARIQ GHAFOR², SADAF SHAHZADI³, SOHAIL SABIR⁴, SAJIDA NASEEM⁵, SYEDA SABAHAT HAIDER⁶

¹Assistant Professor, Department of Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan

²Associate Professor, Department of Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan

³Medical Officer, Department of Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan

⁴Senior Registrar, Department of Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan

⁵Assistant Professor, Department of Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan

⁶Associate Professor, Department of Pathology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan

Correspondence to: Noreen Kousar, Email: noreenkousarnoni@gmail.com, Cell: +92 303 7770095

ABSTRACT:

Cracked nipple is a painful condition for lactating mothers and if untreated leads to lactational mastitis, breast abscesses

Objectives: To compare the efficacy of dexpanthenol, olive oil and breast milk for nipple cracks treatment in lactating mothers

Outcome Measures: We measured the Severity of pain (the primary outcome) by using visual analogue scale (VAS) and healing of cracked nipple (Secondary outcome) was assessed by Nipple trauma score (NTS) before treatment and after 7 days, 14 days of treatment

Material And Methods: We conducted a quasi experimental study from March 2022 to end of August 2022 in Sheikh Zayed hospital, Rahim Yar Khan after ethical approval from institutional review board. The total numbers of 120 patients were equally divided into three groups using Breast milk, Olive oil or Dexpanthenol respectively for their cracked nipples. The data was collected on pre-designed Performance Data

Analysis Procedure: We measured the percentages, means and standard deviations with the help of statistical package for social sciences version (SPSS) version 28. ANOVA test and Non-parametric test were also used to test the difference between study groups

Results: At day 0 baseline mean nipple pain score and nipple trauma score was same in all groups. At day 7 breast milk and olive oil show better reduction in pain as compared to Dexpanthenol. At day 14 olive oil showed statistically significant reduction in pain as compared to breast milk and dexpanthenol. At day 7 and day 14 olive oil show statistically significant better healing of cracked nipples as compared to Breast milk and Dexpanthenol. Practical implication

Conclusion: Our study is proving that olive oil is better than Breast milk and Dexpanthenol in term of pain relief and healing of cracked nipples proving hypothesis: H₂

Keywords: Cracked nipple, olive oil, Breast milk, Dexpanthenol.

INTRODUCTION

Cracked nipple is a painful condition for lactating mothers and may cause mastitis.¹ Many herbal and pharmacological formulations are used to treat cracked nipples. Expressed breast milk is widely used to treat cracked nipples (2). It has immune globulin, antimicrobial contents and healing elements such as growth factor.^(2,3)

Dexpanthenol belongs to the family of B complex vitamins and is also used for cracked nipples.⁴ Dexpanthenol functions as a moisturizer and maintain the softness and elasticity of the skin.

Extra virgin olive oil (EVOO) is a cheap and effective method for management of nipple trauma in many studies.^{6,7} Extra virgin olive oil is a source of three antioxidants substances which are: vitamin E, polyphenols, and phytosterols. Topical application of olive oil to the skin helps in protecting from premature skin aging and also having antiviral, antibacterial, antimicrobial, and anti-inflammatory properties.^{6,7}

There are no standard guidelines on most effective treatment for pain control and healing of cracked nipples.^(9,10,11) Niaz A, et al. reviewed the literature and included 47 studies to draw a conclusion on most effective therapy for cracked nipple treatment. After their review conclusion was made that further studies are required for effective nipple crack treatment therapy.¹⁹

We planned a study to see the efficacy of dexpanthenol, olive oil and Breast milk for the nipple crack treatment in lactating mother to help in providing most effective therapy. Cracked nipple is a risk factor for lactational mastitis and for breast abscesses. Most of the mothers with cracked nipples avoid any pharmaceutical treatment for their concern about toxic effects to their children and present late with complications.

Objectives: To compare the efficacy of dexpanthenol, olive oil and Breast milk for the nipple crack treatment in lactating mothers.

Outcome Measures: We will measure the Severity of pain (the primary outcome) before and after conducting the study by using visual analogue scale (VAS) while healing of cracked nipple

(Secondary outcome) will be assessed by Nipple trauma score (NTS) before treatment and after 7 days, 14 days of treatment.

Research Hypotheses:

H₀: There is no difference if lactating mothers apply dexpanthenol, olive oil or Breast milk for the crack nipple treatment in term of pain control and healing of nipple cracks in lactating mothers.

H₁: Breast milk is more effective than olive oil and dexpanthenol for pain control and nipple crack healing in lactating mothers.

H₂: Olive oil is more effective than dexpanthenol and breast milk for pain control and nipple crack healing in lactating mothers.

H₃: Dexpanthenol is more effective than olive oil and breast milk for pain control and nipple crack healing in lactating mothers

MATERIAL AND METHODS

The study was conducted at Sheikh Zayed hospital, Rahim Yar Khan from March 2022 to end of August 2022 after ethical approval from institutional review board. The study design was quasi experimental.

All the lactating mothers with cracked nipples were included in the study after taking the written and verbal consent. Those with breast abscess, inverted nipple, breast mass or co-morbid diseases were excluded from study. Total 120 lactating females with cracked nipple were selected according to eligibility criteria. We purposely divided selected patients who met the inclusion criteria in three equal study groups.

Group 1: 40 lactating mothers used breast milk for their cracked nipples.

Group 2: 40 lactating mothers used olive oil for cracked nipples.

Group 3: 40 mothers used dexpanthenol for their cracked nipples.

All the patients were given guidelines about the prescribed therapy and they were instructed to wash their breast after each feed. They were advised to apply two to three drops of Breast milk, olive oil or dexpanthenol at nipple-aerola complex according to allocation. The same preparation of olive oil and Dexpanthenol

(5% Dexpanthenol water- in -oil emulsion) was provided to the participants.

The patients who used alternative therapy not followed the instructions were excluded from study. They were called for follow up visit at 7th and 14th day of treatment.

Data Collection Procedure: We collected all the data according to predesigned questionnaire.

Nipple pain was assessed before and after treatment by verbal descriptor scales.

(McGuire, 1984).

The scale used in this study was having 1 to 5 points as described here.

- 1 Just tugging feeling of baby feeding. No pain
- 2 Mild Pain
- 3 Moderate pain.
- 4 Severe pain. 5. The worst pain i can imagine.

The cracked nipple was scored according to Nipple Trauma Score (NTS).

NTS was developed by Abou-Dakn et al, (2011)¹² and described here.

Score 0: No visible skin changes.

Score 1: Edema/erythema or combination of both

Score 2: <25% of nipple surface having superficial damage with or without scab.

Score 3: >25% of nipple surface having superficial damage with or without scab.

Score 4: <25% of nipple surface having partial thickness wound with or without scab formation.

Score 5: >25% of nipple surface having partial thickness wound with or without scab formation.

Data Analysis Procedure: we measured the percentages ,means and standard deviations for descriptive statistics. Data was analyzed by using statistical package for social sciences (SPSS) version 28.

we applied Non Parametric test for hypothesis testing

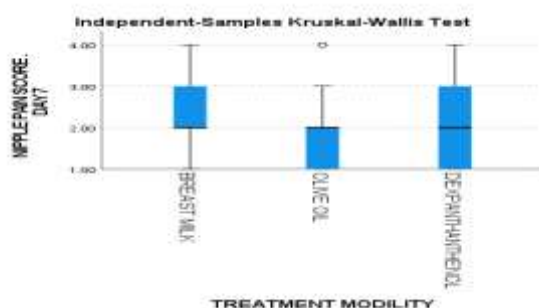
we used ANOVA test for differences in average pain and healing at the final visit.

RESULTS

We included 120 lactating mothers who fulfilled our eligibility criteria and divided them in three equal groups. 96 patients in our study group were primipara (80%) and 24 were multipara (20%). The mean age of patients was 28.99 years and the range was from 18 to 41 years. The groups were having no statistically significant difference in age distribution.

At day 0 baseline mean nipple pain score was same in all groups.

At day 7 breast milk and olive oil show better reduction in pain as compared to Dexpanthenol but difference in breast milk and olive oil was not statistically significant. At day 14 olive oil showed better reduction in pain as compared to breast milk and dexpanthenol and the difference is statistically significant. (Table-2) The Non-parametric test also shown the similar results. (Graph-1,2)

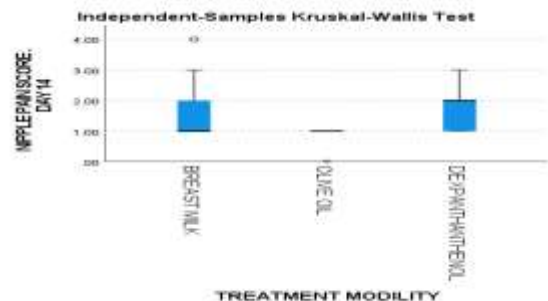


Graph 1:

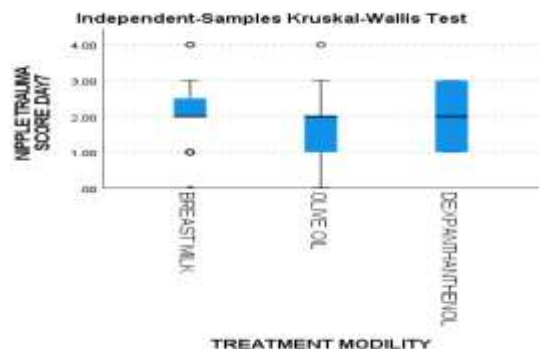
At day 0 baseline mean nipple trauma score was same in all groups

At day 7 and day 14 olive oil show better healing of cracked nipples as compared to Breast milk and Dexpanthenol and difference is statistically significant. (Table -2). The Non parametric tests also favoring that olive oil has better healing of cracked nipples as compared to Breast milk and dexpanthenol. (Graph-3,4).

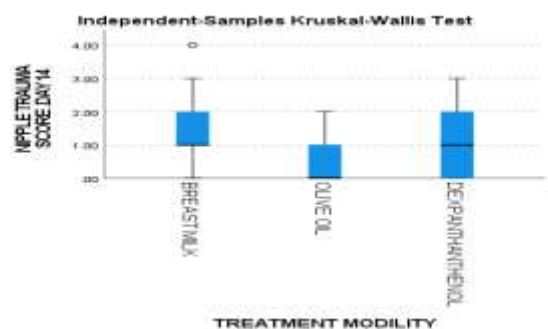
Our study is proving that olive oil is better than Breast milk and Dexpanthenol in term of pain relief and healing of cracked nipples proving H_2 hypothesis.



Graph 2:



Graph 3:



Graph 3:

DISCUSSION

Nipple pain and cracking leads to several problems, including severe pain, bleeding, galactoceles, lactational mastitis, and breast abscesses.¹²

Nipple cracking is more common in primipara than multipara mothers as already observed in other studies.¹³ We are having similar results in our study as 96 mothers were primigravida (80%) and 24 were multigravida (20%). The mean age of the

patients was 28.99 years with the range from 18 to 41 years. The age distribution difference between the groups is not statistically significant.

Nipple pain and cracking is a symptom of inflammation as a result of repeated mechanical forces during feeding and it leads to minute haemorrhage and signs of inflammation.¹³ The skin of the nipples has natural healing tendency but also exposed to cracking during lactation.^{13,14}

There is tendency of overmedication and overtreatment for cracked nipples for lactating mothers when they present with nipple pain, and ulceration of the nipple-areolar complex without considering the etiology.^{15,16}

Many herbals and pharmaceutical preparations are used for crack nipples treatment and investigated by many researchers.^{17,18} The most commonly investigated therapies are Breast milk, olive oil, coconut oil, manthol, lanolin, cabbage leaves etc.^{19,20} But there is no conclusion on most suitable treatment.^{17,18}

Our study try to investigate the suitable treatment modality. We compared the effectiveness of breast milk, olive oil and dexpanthenol for treatment of cracked nipples. Our primary outcome measure was breast pain. We measured the Severity of pain (the primary outcome) before and after conducting the study by using visual analogue scale (VAS). At day 7 breast milk and olive oil were showing better reduction in pain as compared to Dexpanthenol but at 7th day the difference between breast milk and olive oil in term of pain control was not statistically significant. At day 14 olive oil showed better reduction in pain as compared to breast milk and dexpanthenol and the difference is statistically significant. (Graph-1,2) Our study results are showing that the olive oil is most efficient in controlling the breast pain on 7th and 14th day of treatment as compared to breast milk and Dexpanthenol. The expressed breast milk is not effective on controlling the nipple pain as already observed by M.Abou-Dakn and his colleagues in their study.²¹ Olive oil is more effective for pain control in lactating mothers as compared to breast milk in the study conducted by Hables RM.²²

The second variable in our study was to compare healing of cracked nipples by using Breast milk, olive oil and Dexpanthenol.

The healing of cracked nipple (Secondary outcome) was assessed by Nipple trauma score (NTS) before treatment and after 7 days, 14 days of treatment. At day 7 and day 14 olive oil show better healing of cracked nipples as compared to Breast milk and Dexpanthenol and difference is statistically significant. (Table -2). The Non parametric tests also favoring that olive oil has better healing of cracked nipples as compared to Breast milk and dexpanthenol. (Graph-3,4)

Our study results are showing that olive oil is more effective in crack healing as compared to breast milk. Hables R M et al, compared the coconut oil, olive oil and breast milk for the treatment of cracked nipples. They randomly divided the 135 mothers in three equal groups. They assessed their participant with the help of Nipple trauma score. There was no significant difference between the groups at First visit with p value <0.05. There was significant difference between the mean score of three groups at day 7 and day 14 with p value <0.01. The results of this study showing that olive oil, breast milk and coconut oil are having positive effects of nipple healing but breast milk is least effective.²²

Other studies also showing that Breast milk is least effective in healing of cracked nipples as compared to olive oil.^{23,24}

Dexpanthenol-containing ointments have a long history of use for wound healing particularly in the treatment of cracked nipples.²⁵ In our study dexpanthenol is less effective as compared to olive oil in healing of cracked nipples and pain.²⁶ Although other studies support the topical application of dexpanthenol-containing ointments to facilitate wound healing in lactating mothers for nipple cracks.^{26,27}

Dexpanthenol is effective in wound healing as shown by different studies.^{26,27} Specifically, topical application of dexpanthenol-containing ointments facilitates wound healing in women with nipple cracks.^{28,29}

In our study Dexpanthenol is not having effective pain control and healing as compared to olive oil. The literature search is deficient in exploring the comparison between olive oil and dexpanthenol in treatment of cracked nipple.

CONCLUSIONS

ANOVA Table 1:

| | | | Sum of Squares | df | Mean Square | F | Sig. |
|--|----------------|------------|----------------|-----|-------------|--------|-------|
| Nipple Pain Score .Day 0 * Treatment Modality | Between Groups | (Combined) | .000 | 2 | .000 | .000 | 1.000 |
| | Within Groups | | 87.200 | 117 | .745 | | |
| | Total | | 87.200 | 119 | | | |
| Nipple Pain Score .Day 7 * Treatment Modality | Between Groups | (Combined) | 2.717 | 2 | 1.358 | 2.140 | .122 |
| | Within Groups | | 74.275 | 117 | .635 | | |
| | Total | | 76.992 | 119 | | | |
| Nipple Pain Score .Day 14 * Treatment Modality | Between Groups | (Combined) | 10.017 | 2 | 5.008 | 13.836 | <.001 |
| | Within Groups | | 42.350 | 117 | .362 | | |

It is apparent that Olive oil is having better pain control and healing properties in treating cracked nipples as compared to Breast milk and olive oil as proven in our study. This study is favouring the H₂ hypothesis. Further research is required in this field as natural products are user friendly and having minimum adverse effects.

Anova Table 2:

| | | Sum of Squares | df | Mean Square | F | Sig. |
|-----------------------------|----------------|----------------|-----|-------------|--------|-------|
| Nipple Trauma Score .Day 0 | Between Groups | .000 | 2 | .000 | .000 | 1.000 |
| | Within Groups | 64.925 | 117 | .555 | | |
| | Total | 64.925 | 119 | | | |
| Nipple Trauma Score .Day 7 | Between Groups | 5.217 | 2 | 2.608 | 3.915 | .023 |
| | Within Groups | 77.950 | 117 | .666 | | |
| | Total | 83.167 | 119 | | | |
| Nipple Trauma Score .Day 14 | Between Groups | 27.950 | 2 | 13.975 | 20.343 | <.001 |
| | Within Groups | 80.375 | 117 | .687 | | |
| | Total | 108.325 | 119 | | | |

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